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10/500,738	07/06/2004	Teemu Tanner	032221-049	6685

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EXAMINER
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KINNEY, ANNA L

ART UNIT	PAPER NUMBER
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1731

DATE MAILED: 08/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/500,738

Applicant(s)

TANNER, TEEMU

Examiner

Anna Kinney

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 5/19/06.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 21-40 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 21-40 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Response to Arguments***

Applicant's arguments, see Remarks, pg. 8, last paragraph, regarding the furnish used, filed May 19, 2006, with respect to the rejection(s) of claim(s) 1-20 under 35 USC 103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Speaks et al (U.S. 6,364,999).

In response to applicant's argument that Janson is concerned exclusively with the bleaching of chemical pulp (Remarks, pg. 7), the Examiner disagrees. Nothing in the specification excludes the recovery of liquors from non-chemical pulping processes. However, the Examiner has revised the rejections to apply Janson only in relation to chemical recovery, and not in relation to the bleaching step itself.

In response to applicant's argument that Janson intends the use of sodium borate to actively participate in the further delignification of chemical pulp and not to obtain an alkaline condition during bleaching (Remarks, pg. 8, ¶ 1), the Examiner disagrees. Janson describes both pulping and bleaching generally as delignification (col. 1, lines 67-68 and col. 2, line 12). Bleaching provides some small degree of delignification, which varies depending upon the bleaching chemicals used, as evidenced by Rydholm (pg. 886, last ¶). Even hydrogen peroxide can be used to delignify pulp under the right conditions, as evidenced by Eckert (U.S. 4,427,490; col. 4, lines 15-23). But under alkaline pHs, substantially no delignification is obtained (col. 2, lines 53-60). Since Janson's bleaching example provide for a pH of 9.9 to 10.9 (col. 4,

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lines 43-50), the Examiner construes the combination of references to provide for an insubstantial degree of delignification (i.e., slightly more than 0) in the bleaching step. Therefore, the delignification identifier of Janson simply serves to differentiate the pulping and bleaching steps that provide spent liquor from the combustion and autocausticisation steps that provide regenerated chemicals (col. 2, lines 12-22). The Examiner notes that Janson proposes replacement of hydroxide with borate or phosphate as the pulping or bleaching alkali, so even if Janson suggests another advantage for the use of borate or phosphate, the alkali used provides the alkaline conditions of the bleaching step

In response to applicant's argument that sodium borates of Janson would be expected to melt (Remarks, pg. 8, ¶ 2), the Examiner disagrees. Janson clearly allows for a wide range of combustion temperatures (col. 2, lines 53-56) and the dependency of the type of residue, ash or melt, on the temperature used (col. 2, lines 3-6). Janson does not require the temperature to be above 900°C, as discussed by applicant in Remarks. Janson also allows for analogous use of aluminates for borates (col. 3, lines 35-37), of which sodium aluminate (which corresponds to the sodium ion of Janson, e.g., col. 2, lines 27-39) has a melting point of 1800°C, as evidenced by Hawley (Gessner G. Hawley, The Condensed Chemical Dictionary, 10<sup>th</sup> Edition, Van Nostrand Reinhold Co., 1981, pg. 932), which is above the combustion temperature range disclosed by Janson.

Applicant's arguments with respect to Nykanen et al (Remarks, pgs. 10-11), as applied against claims 28-29 and 39-40, have been considered but are moot in view of the new ground(s) of rejection.

In response to applicant's arguments against the references individually, such as regards Yahrmarkt et al (Remarks, pg. 9), one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 21-40 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites the limitation "an improved integrated method" in line 1 of the claim. The limitation suggests that the applicant may have intended to write the claim in Jepson format, as described in 37 CFR 1.75(e). However, the Examiner cannot determine what steps or limitations the applicant considers as improved. Otherwise, the term "improved" in claim 1 is a relative term which renders the claim indefinite. The term "improved" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would

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not be reasonably apprised of the scope of the invention. Therefore, the integrated method is indefinite.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 21-22, 27-28, and 38-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Speaks et al (U.S. 6,364,999), in view of Admitted Prior Art (Specification, pgs. 2-3), Rydholm (Sven A. Rydholm, Pulping Processes, Interscience Publishers, 1967, pp. 282, 395, 423, 717, and 1082), Batchelor (Brian K. Batchelor, "Sonoco chemical recovery plant – operational experiences," Appita, Vol. 33, No. 6, May 1980, pp. 447-453; supplied by applicant), and Janson (U.S. Patent 4,116,759).

With respect to claims 21 and 22, Speaks discloses an improved (col. 6, lines 10-13) integrated (col. 3, lines 32-33) method for preparing mechanically defibered bleached wood pulp (col. 17, lines 16-50) comprising: mechanically defibering wood chips to form wood pulp (col. 17, lines 11-15 and 27-29; and col. 18, lines 7-11), bleaching the wood pulp (col. 17, lines 47-50) with peroxide (col. 31, lines 63-65), cleaning (col. 17, lines 54-58), which the Examiner construes as washing the resulting bleached wood pulp to form a spent liquor, and chemical recovery of spent liquor (col. 19, lines 21-29). Speaks further discloses alkaline conditions for hydrogen peroxide

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application (col. 29, lines 20-22), and pulping in the presence of sodium aluminate (col. 4, lines 16-20), an alkali metal aluminate.

Speaks does not disclose expressly that the wash step is performed with water, or any specific steps for chemical recovery.

Admitted prior art discloses impregnating mechanical pulp and bleaching the pulp with alkaline peroxide, concentrating the spent liquor, combusting the concentrated spent liquor (pg. 2, line 30 – pg. 3, line 1), and dissolving combusted sodium (i.e., an alkali metal) aluminate in water (pg. 3, lines 21-22).

Rydholm discloses that semichemical pulping is more adequately described as chemimechanical pulping (pg. 282, last ¶, lines 18-24), which the Examiner construes to be a method for preparing mechanical defibered pulp. Rydholm also discloses washing pulp with water (pg. 717, last ¶, lines 3-5).

Batchelor discloses a semichemical pulping process (pg. 447, col. 1, lines 1-5), wherein spent liquor is evaporated, combusted, and heat and chemicals are recovered (pg. 447, col. 2, lines 24-27), and combustion forms an ash containing sodium (an alkali metal) aluminate (pg. 447, col. 2, lines 33-37) in the absence of the formation of a melt (pg. 447, col. 1, ¶3, lines 1-2) with the discharge of hot flue gases (pg. 449, col. 2, 3<sup>rd</sup> full ¶, lines 1-3).

Janson discloses a method for recovering pulping or bleaching chemicals from spent liquor by concentrating and combusting the spent liquor (Abstract) and dissolving the ash thus formed into water (col. 2, lines 45-46), adding said water containing dissolved alkali metal aluminate to defibered wood pulp (col. 4, line 54 – col. 5, line 5

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and col. 3, lines 45-46) prior to a bleaching step so that said alkali metal aluminate derived from said ash contributes to the alkaline bleaching conditions (col. 1, lines 35-38).

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to apply hydrogen peroxide under alkaline conditions, concentrate and combust spent liquor, and dissolved combusted sodium aluminate in water, as described by Admitted prior art, wash pulp with water as described by Rydholm, evaporate and combust spent liquor to produce an ash containing sodium aluminate without forming a melt, and with the discharge of gases as described by Batchelor, and apply a method of recovering chemicals as described by Janson to the production method of bleached, mechanically defibered pulp of Speaks, to obtain the invention as specified in claim 21-22.

The motivation would have been to reduce the environmental load of the plant (Admitted prior art, pg. 2, lines 21-24; and Speaks, col. 6, lines 10-19); to dispose of the spent liquor in an environmentally acceptable manner at minimum cost (Batchelor, col. 1, lines 27-30); that smelt based processes have high capital costs (Batchelor, col. 1, lines 35-36); that chip refining offers possibilities of chemical pretreatment to a much larger extent than does grinding (Rydholm, pg. 395, lines 10-11); that because of the high lignin content of the unbleached pulp, the cost of bleaching chemicals is considerable (Rydholm, pg. 423, last ¶, lines 15-16); that several of the brightness units gained in the bleachery are lost again if the mill water is unsuitable (Rydholm, pg. 1082, last ¶, lines 3-5); and that since alkali is required also for the bleaching of pulp,



conventional bleaching alkali can be substituted by chemicals, which can be regenerated (Janson, col. 1, lines 35-38).

With respect to claims 27 and 38, Janson discloses that the concentrated spent liquor of said bleaching step is combusted at a temperature of 200-1500°C (col. 2, lines 53-56 and lines 3-6), which encompasses the claimed range of 500-1100°C.

With respect to claims 28, 39, and 40, Batchelor discloses spent liquor is concentrated to a solids content of 52% (p. 448, col. 2, lines 5-8), which contains one specific point within the claimed range of at least about 30% for claim 28, and is about 45%, which is one specific endpoint of the claimed range of about 35 to 45% for claims 39 and 40. The Examiner notes that in order to concentrate liquor from 10% solids to 52% solids, the liquor must pass through a condition having a solids concentration of 35 to 45%. At the time of the invention, absent a showing of unexpected results, it would have been obvious to a person of ordinary skill in the art to optimize the final solids content to achieve efficient combustion. It has been held that discovering the optimum or workable ranges or an optimum value of a result effective variable involves only routine skill in the art. See MPEP 2144.05 II.

Claims 23 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Speaks et al, Admitted Prior Art, Rydholm, Batchelor, and Janson, as applied to claim 22 above, and further in view of Yahrmarkt et al (U.S. 4,388,148).

With respect to claim 23, Admitted prior art discloses impregnating wood chips to be mechanically defibered and passing the wood pulp after mechanical defibered to bleaching under alkaline conditions (pg. 2, line 30 – pg. 3, line 1 and pg. 3, lines 29-31).

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Since no washing or pressing step is disclosed between impregnation and bleaching, the Examiner construes this to mean that the alkaline conditions in the bleaching step are at least partially obtained using the alkali present in impregnation.

Janson discloses substituting conventional bleaching alkali with chemicals that can be regenerated (col. 1, lines 35-38).

Speaks et al, Admitted Prior Art, Rydholm, Batchelor, and Janson do not disclose expressly that sodium aluminate is added to the wood chips before defibration.

Yahrmarkt et al discloses a method for preparing mechanically defibered wood pulp (col. 2, lines 42-45) with impregnation (col. 5, lines 44-49), and discloses adding sodium aluminate to a material before it is in a refiner (col. 4, lines 42-50).

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to add sodium aluminate to wood chips prior to refining as described by Yahrmarkt et al in the pulp production and recovery method of Speaks et al, Admitted Prior Art, Rydholm, Batchelor, and Janson, to obtain the invention as specified in claim 23.

The motivation would have been to reduce energy consumption in the mechanical treatment of the pulp material (Yahrmarkt, Abstract, lines 1-6).

With respect to claim 24, at the time of the invention, it would have been obvious to a person of ordinary skill in the art to use the dissolved combusted sodium aluminate of Admitted prior art (pg. 3, lines 21-22) as the sodium aluminate alkali source for impregnation, as discussed in the rejection to claim 23, above.

With respect to claim 31, Kilgannon is applied as in the rejection to claim 25, above.

Claims 25-26, 30, 32-34, and 36-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Speaks et al, Admitted Prior Art, Rydholm, Batchelor, and Janson as applied to claim 21 above, and further in view of Kilgannon et al (U.S. 2004/0040679 A1).

Speaks et al, Admitted Prior Art, Rydholm, Batchelor, and Janson do not disclose expressly temperature and pH conditions for bleaching mechanical pulp.

Kilgannon et al discloses a method of thermomechanical wood pulp production (pg. 1, col. 1, ¶ 0002) and bleaching with hydrogen peroxide, wherein the bleaching pH range is 9.5 to about 11.5 (pg. 3, col. 1, ¶ 0033), which contains two specific points within the claimed range of about 9.5 to 12.5 for claims 26 and 34, and one specific point within the claimed range of about 10 to 12 for claims 36 and 37; and the bleaching temperature is about 50 to about 70°C (pg. 3, col. 1, ¶ 0033), which contains two specific points within the claimed range of about 20 to 150°C for claims 25 and 30, and within the claimed range of about 50 and 100°C for claims 32 and 33.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to bleach mechanical pulp under conditions as described by Kilgannon et al in the pulp production and chemical recovery method of Speaks et al, Admitted Prior Art, Rydholm, Batchelor, and Janson to obtain the invention as specified in claims 25-26, 30, 32-34, and 36-37.

The motivation would have been that the chemicals or conditions for bleaching thermomechanical pulp are well known in the art (pg. 4, col. 1, ¶ 0044).

Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Speaks et al, Admitted Prior Art, Rydholm, Batchelor, and Janson, as applied to claim 28 above, and further in view of Crosby et al (U.S. Patent 3,396,076).

With respect to claim 29, Speaks et al, Admitted Prior Art, Rydholm, Batchelor, and Janson do not disclose expressly that flue gases are used to concentrate spent liquor. However, Batchelor does disclose that spent liquor concentration is achieved using steam and that combustion gases are used to produce steam (p. 448, Fig. 1).

Crosby discloses recovery of bleach plant effluent and that the concentrated spent liquor of the bleaching step is further concentrated with hot flue gases (col. 4, lines 22-36) discharged from the combusting step of said spent liquor.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use flue gases to concentrate spent bleaching liquor as described by Crosby in the pulp production and chemical recovery method of Speaks et al, Admitted Prior Art, Rydholm, Batchelor, and Janson to obtain the invention as specified in claim 29.

The motivation would have been that this greatly reduces odor emission from the recovery furnace stack (col. 4, lines 34-36).

Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over Speaks et al, Admitted Prior Art, Rydholm, Batchelor, Janson, and Yahrmann, as applied to claims 21-23 above, and further in view of Kilgannon, as applied to claim 25, above.

The temperature range of Kilgannon is applied as in the rejection to claim 25, above.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to apply a temperature range as described by Kilgannon to the pulp production and chemical recovery method of Speaks et al, Admitted Prior Art, Rydholm, Batchelor, Janson, and Yahrmarkt, for the reasons cited in the rejection to claim 25, above.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. 4,070,233 shows chemical recovery in the form of ash from a mechanical pulping process. U.S. 5,246,542 shows liquor evaporation and chemical recovery for bleached chemical thermo-mechanical pulp.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of


the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anna Kinney whose telephone number is (571) 272-8388. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on 571-272-1189. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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